# Command & Control Workstation Navigation Concept

A presentation to CLCS users

10/20/97



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# Introduction

## Purpose

- Describe overall screen navigation within the Command & Control Workstation

## Presentation notes

- This is not a presentation of screen details
  - Viewer layouts to be worked by small sub-teams (4-5 members)
  - Placement of items are suggestions and are subject to change
- This is a presentation of the entire navigation concept
  - Many items are not intended for the Thor release (3/98)
  - The full picture allows
    - Implementers/Users to understand the total navigation package
    - Users to recognize the Thor delivery is an interim drop

## Terms

Dynamic Display - a Real-Time Control Application that provides advanced command and control
Monitor - a physical LCD/CRT device
Screen - a software produced picture (typically re-sizable, moveable, iconable)
Viewer - a system software developed application that provides data to the user (via a screen)
Window - same as screen

# User Realities

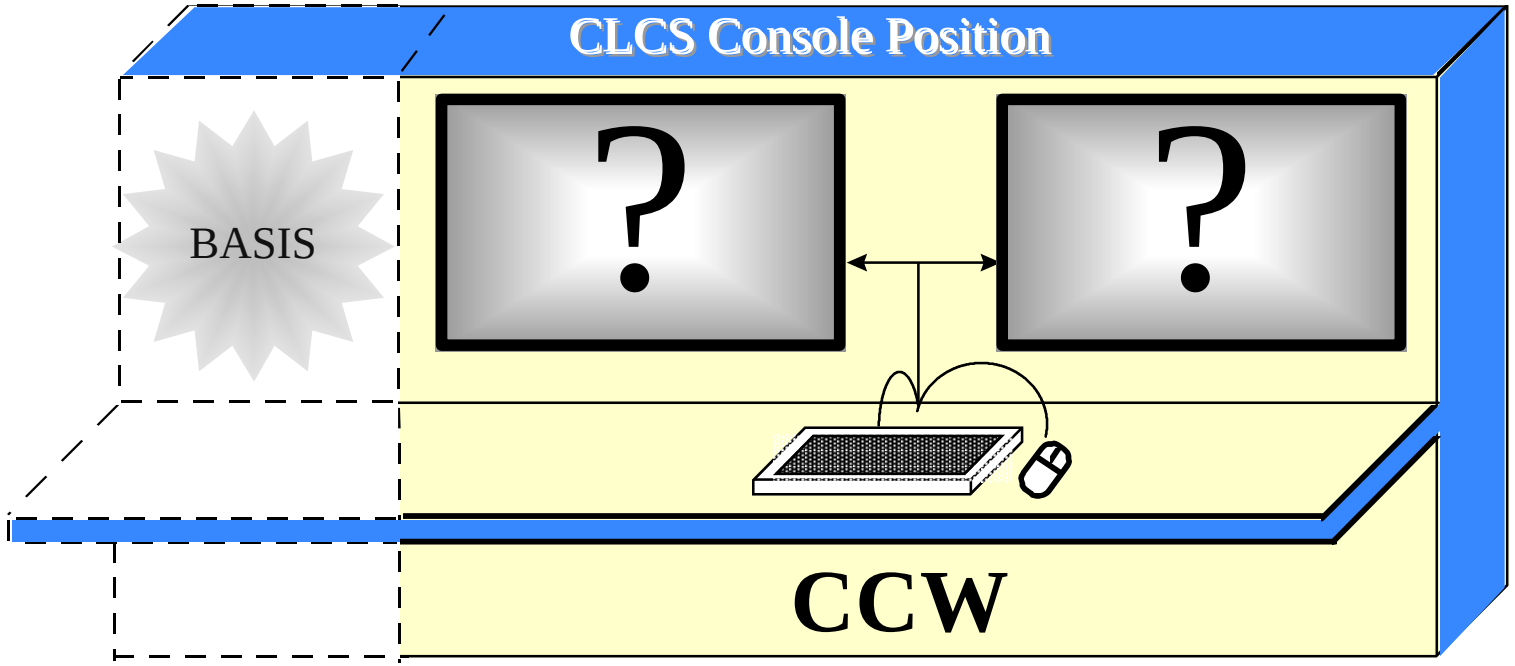
## Problem Space

- Screen control complicated by 1:1 relationship between user and monitor
  - CCMS provides 23 individual “views” across three CRTs
  - CLCS uses 2-20” monitors per Command & Control Workstation
- Screen flexibility in CLCS could create screen management problems
  - Must efficiently present data and not overwhelm user
  - Icons, screen resizing can obscure screens from user

## Goals

- Decrease the odds for error by encapsulating processes
  - Minimize number of duplicate entry methods for the same control
  - User has one consistent way to operate the system
- Provide inter-monitor navigation
- Minimize inter-monitor mouse movement actions
- Minimize number of pop-ups
- Standardize placement/functionality of similar functions (e.g., subscribe, close, print)

# Physical Console




## Restrictions/Limitations/Assumptions

- CCW to human view provided by 2-20” monitors
- One keyboard/mouse used to navigate between two monitors
- Mouse pointer transcends both monitors (inter-monitor mouse movement)
- User cannot transport windows/screens from one monitor to another

CLCS console layout is a notional concept only



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# Concept

Designate a specific functionality to each monitor

- Dynamic Displays are viewed in the primary monitor
  - This is the focal point for most user interaction
  - A “wrapper” is deployed around the Dynamic Display
    - Provides common use data
    - Always on-top
    - Places data in same area regardless of test set specifics
  - Select viewers can be displayed on primary monitor (depending on User Class)
    - Some viewers are ‘owned’ by a specific user (e.g., $SYS by Master)
- Messages/viewers/data tools deployed on secondary monitor
  - Monitor provides general status
  - The same viewer appears in the same location (user can move after the fact)
  - A side “wrapper” is displayed on the secondary monitor
    - Allows quick access to viewers/messages
    - Always on-top
    - Provides limited common data (common data always available on primary monitor)
  - Capability provided for auxiliary Dynamic Display (should operations dictate)



Developers refer to the “Wrapper” as:
Command & Navigation System (CNS)

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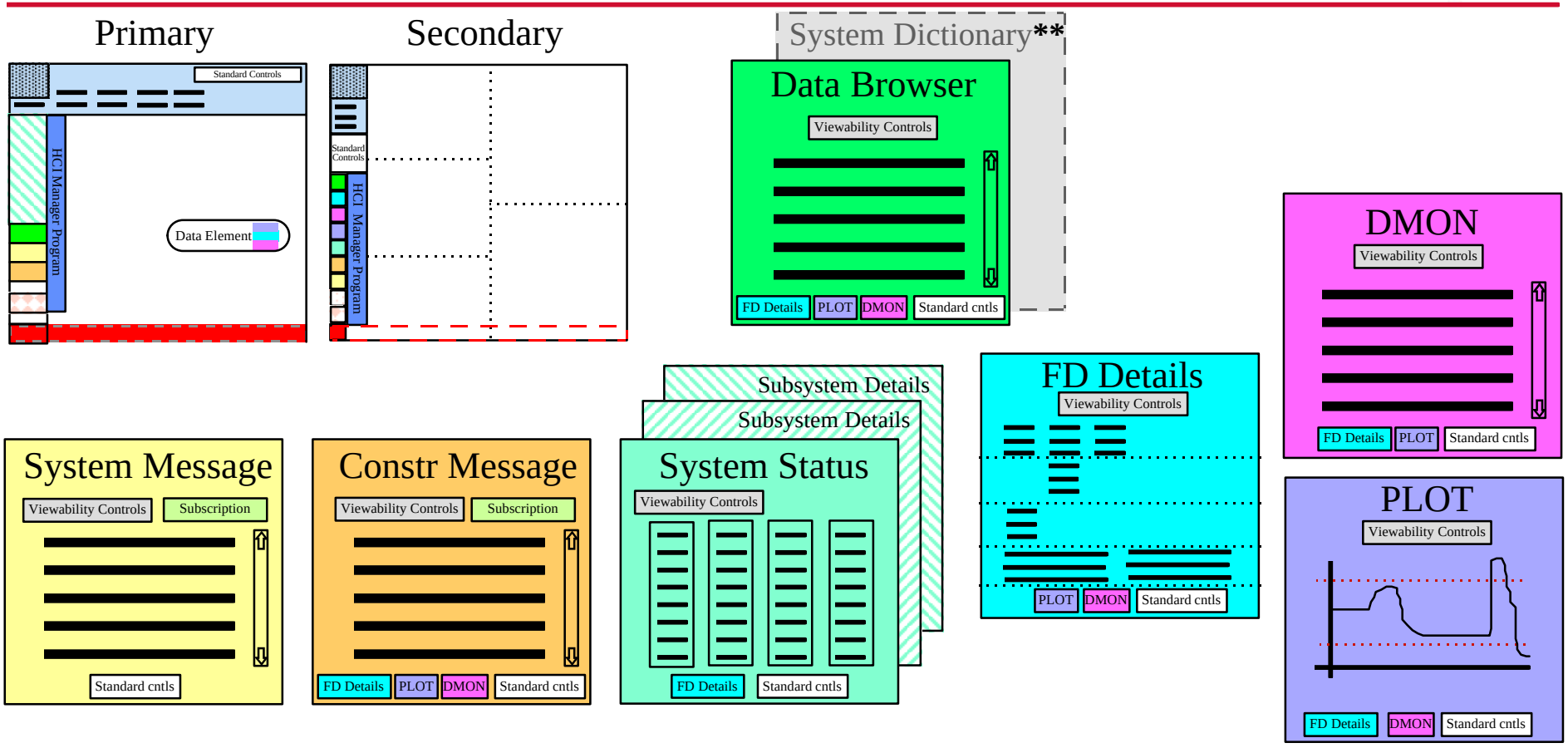
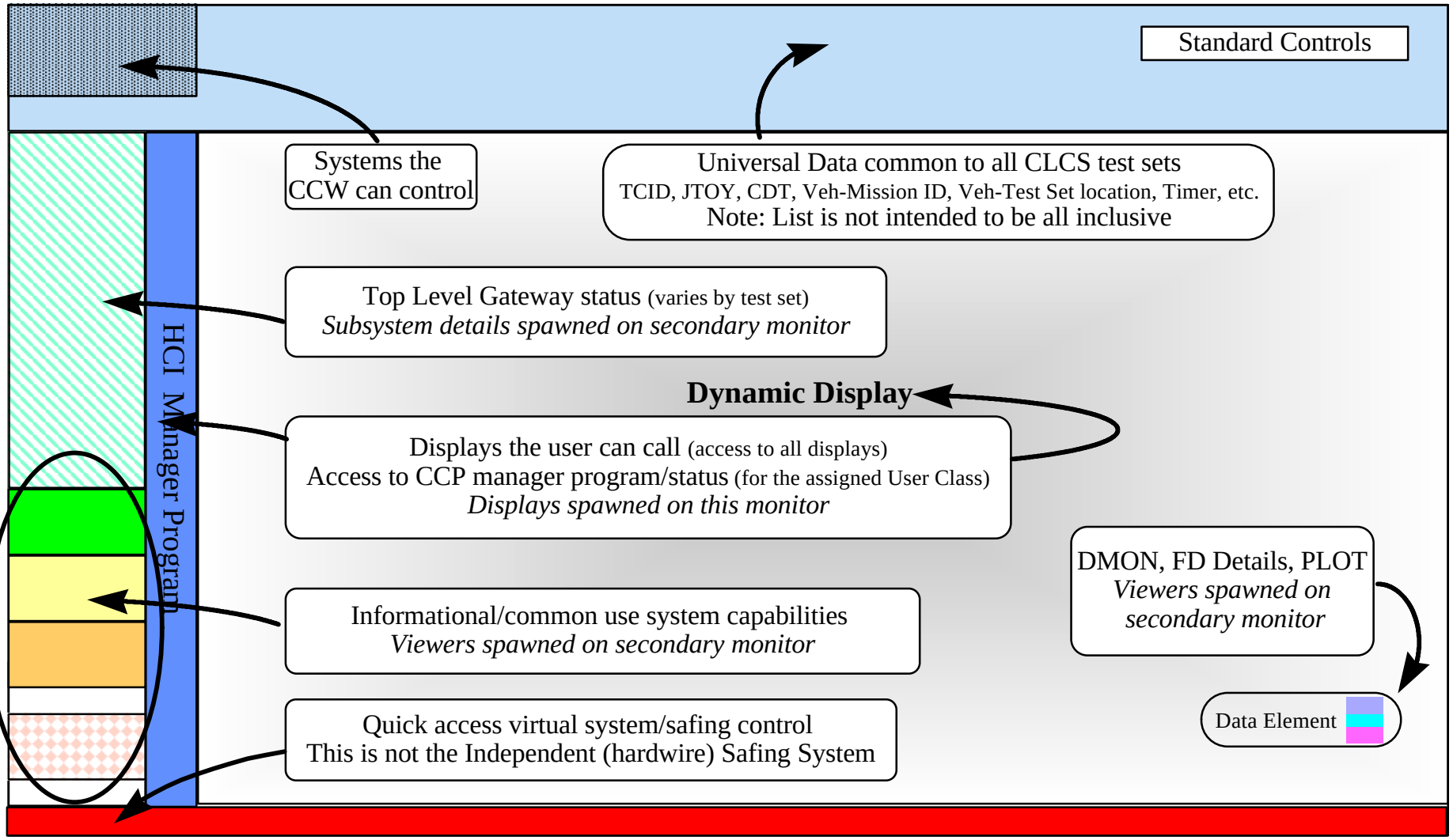
# Screen Parts

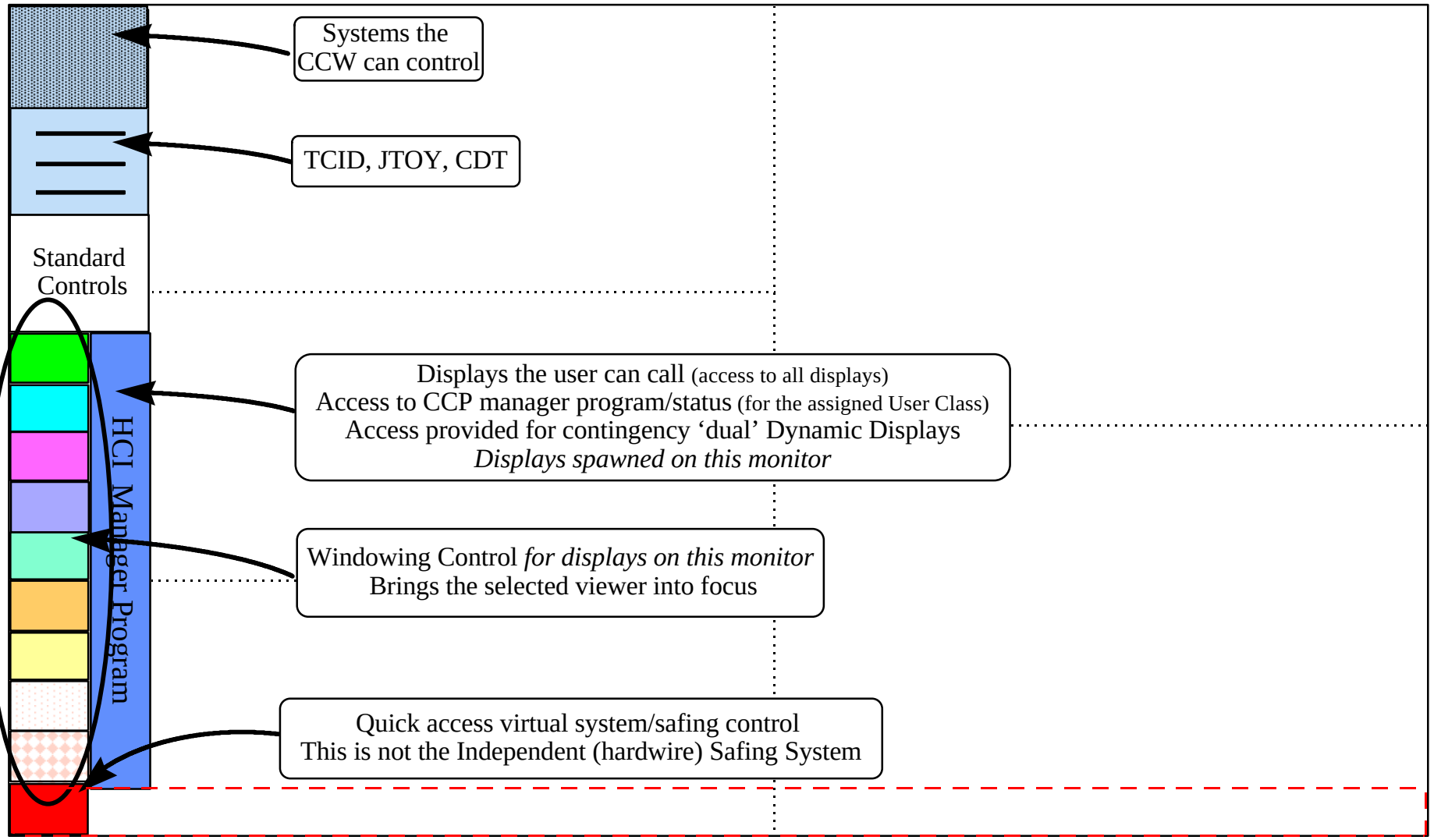



** These viewers are not part of Thor.

# Primary CCW Monitor Concept



# Secondary CCW Monitor Concept




Secondary Screen partitioning to be worked



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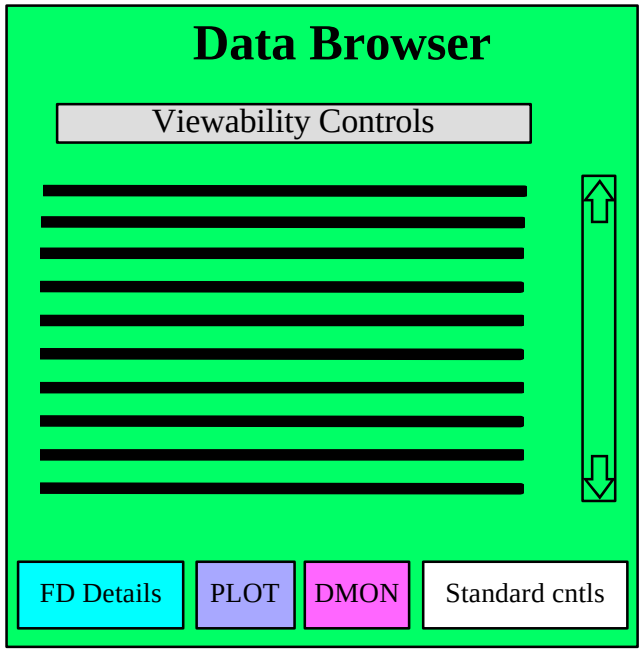
# Data Browser Concept




Scrollable list of Data within CLCS

- Primary access to Data
  - Starting point for DMON, FD Details, PLOT
- All Data types:
  - Command, Measurement, FD, Fused, system, etc.
- Viewability Controls provide
  - Sort controls
    - Defaults provided for User Class
    - User Class preferences provide subsorts/lists

Eventually replaced by System Dictionary**

** System Dictionary is a post Thor future requirement



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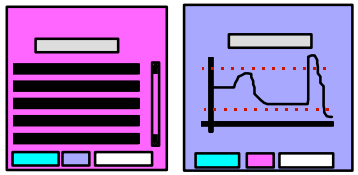
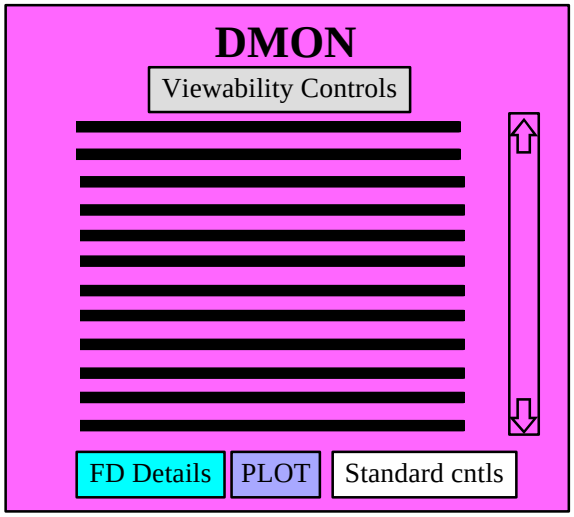
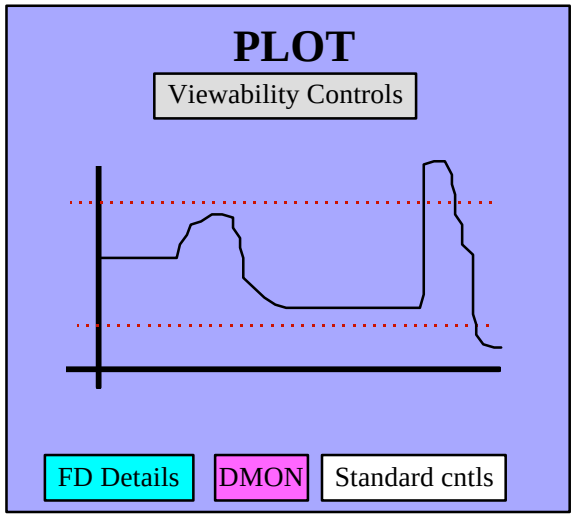


# DMON/PLOT Concept

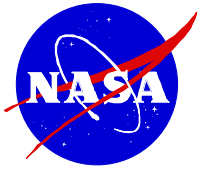

## Scrollable list with most recent data value

- Data input from:
  - Browser, Dynamic Display, Constr Msg, FD Details, PLOT
- Viewability Controls provide
  - Sub-sorts/lists provided within User Classes
  - Ability to add/remove
  - Ability to hide “time”




## Time oriented plot of data

- Data input from:
  - Browser, Dynamic Display, Constr Msg, FD Details, DMON
- Viewability Controls provide
  - Sub-sorts/lists provided within User Classes
  - Ability to add/remove
  - Ability to hide “time”
  - Standard “plot” type controls
- Need to work ‘quick’ retrieve, multi-plot access



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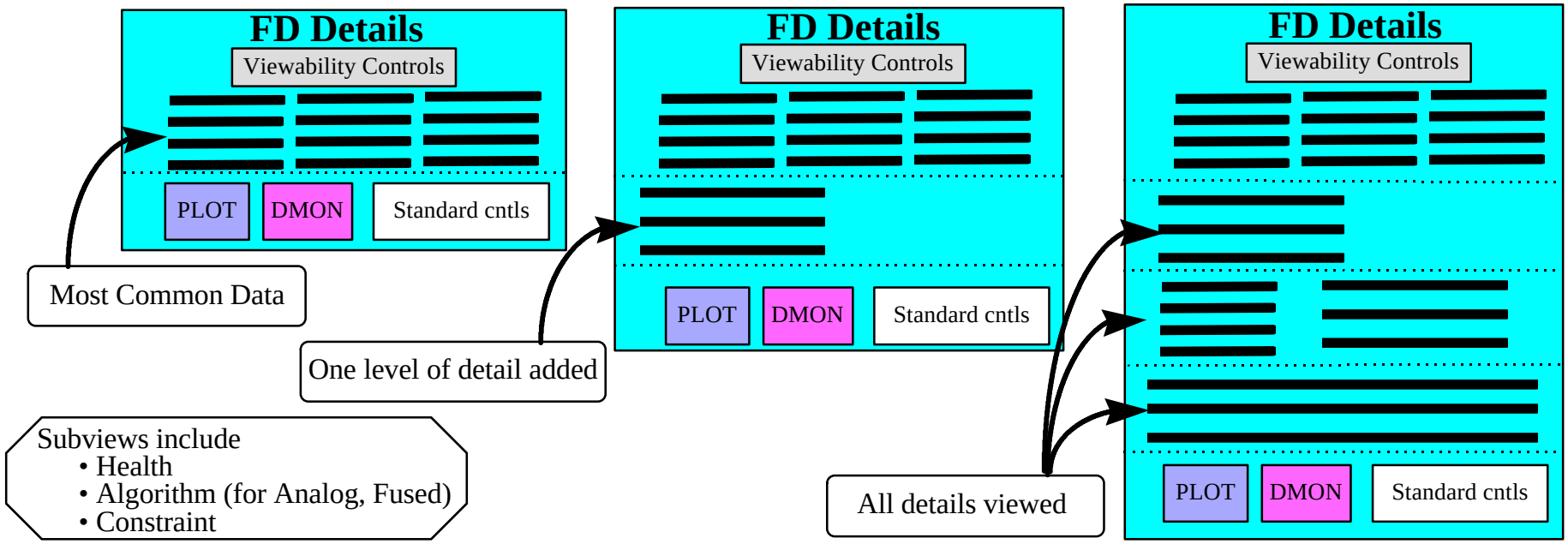
# FD Details Concept

FD information for all data types (Command, Measurement, FD, Fused, system, etc.)

- Data input from:
  - Browser, Dynamic Display, Constr Msg, PLOT, DMON, Pending Constr, Sys Status
- Viewability Controls provide
  - Access to lesser used data
  - Ability to hide “time”
  - One shot rescan or scan data cyclically
- Screen/Window grows (i.e., no pop-ups)
- Control provided within the GUI when user has command authority for the FD



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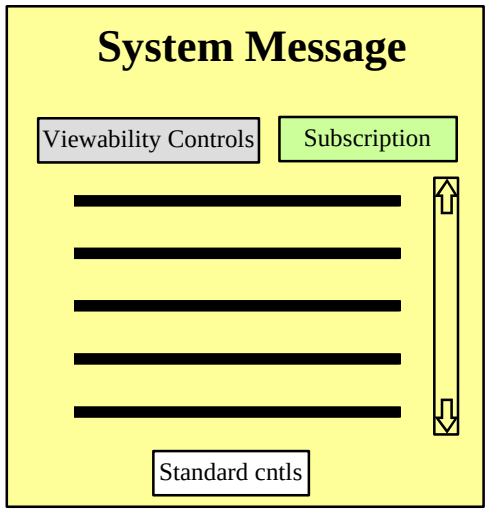
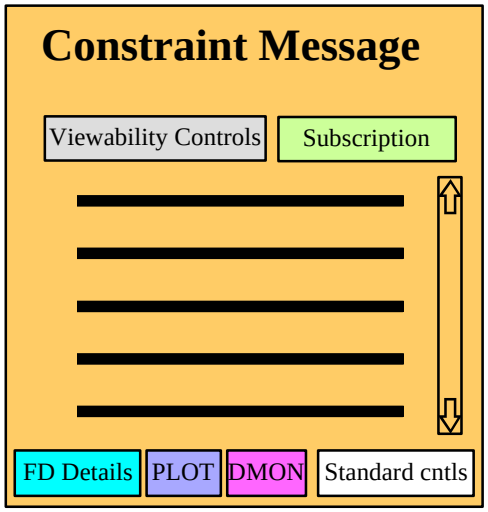
# System/Constraint Message Concept




## Scrollable list of System messages

- Defaults provided for User Classes
- Viewability Controls provide
  - Sub-sorts/lists provided within User Classes
  - Ability to acknowledge, erase, hide, unhide, etc.
- Subscription provides
  - Capability to view more than the defined default
  - Add/remove User Class or specific message




## Scrollable list of Constraint (Event) messages

- Defaults provided for User Classes
- Viewability Controls provide
  - Sub-sorts/lists provided within User Classes
  - Ability to acknowledge, release, erase, etc.
- Subscription provides
  - Capability to view more than the defined default
  - Ability to add/remove User Class



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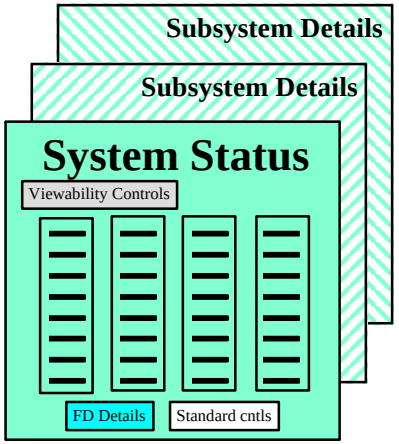
# Other Displays




CLCS Hardware Status and Integrity
- Provides overview of system health (like $SYS in CCMS)
- Subsystem details provide greatest depth into system
- System Status accessed from
  - Secondary Monitor
  - HCI Manager Program (allows display on Primary Monitor)
- Subsystem Details accessible from
  - System Status
  - Gateway summary area on primary monitor

**Command GUI**

User entry interface for commands
- Command line provided (like CPRO in CCMS)
- GUI provides access to commands not supported by other interfaces
- Command 'file' capability provided** (like $CMD in CCMS)

**Console Allocation**

GUI shows relationship between CCW and User Class (Engineering Discipline)
- Viewability provides CCW→User Class or User Class→CCW
- CCW must have 'Console Allocation' User Class to invoke change

**ControlShell EIM Viewer**

GUI provided by ControlShell COTS product
- Shows End Item Manager (EIM) operation via graphical visualization
- View only, commands invoked through Dynamic Display

** Command file access requires appropriate authority



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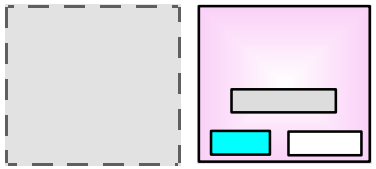
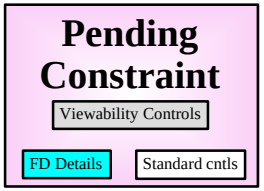
# Future Requirements



**System Dictionary**

Scrollable *integrated* "view" of the CLCS system
- User selectable viewpoints
  - FD, User Class, Subsystem, (EIM/EIC) Component
- Replaces Data Browser
- Provides functionality necessary for Command Assignment
- Provides access to Pending Constraint and other internal views




GUI shows all pending Constraints
- Scrollable list, will spawn FD Details viewer
- Viewability Controls allow sort by FD, Sort by Application, etc.

Navigation prototyping is required in the near future
- Verify capabilities can be incorporated into CCW processor
- Mouse augmentation required
  - Keyboard method to invoke "in focus display" actions
    - Maximize, Minimize, Cancel, Acknowledge, Print, etc.
  - Reduces inter-screen mouse movement
  - Provides quick access to commonly used actions



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# Open Issues

## Physical Workstation Issues

- User interacts with both CCW monitors for data entry
  - CCW monitors should be at same eye-height
  - CCW monitors must be placed close to one another (within inches if possible)

## Viewer Issues

- Iron out specific data placement within each viewer
- Define default location of viewers on Secondary monitor
- Establish well defined Viewability Controls, including:
  User Class defined sublists, control of "time" data, Cross viewer commonality, etc.
- Determine the multi-plot methodology
- Establish number of viewer screens that can be invoked

| Viewer type | # available |
|---|---|
| **DMON** | **1** |
| **System Message** | **1** |
| **Constraint Message** | **1** |
| **PLOT** | **? max** |
| **FD Details** | **? max** |
| **Data Browser** | **1** |

# Conclusion

## Summary

- Navigation concept dramatically reduces number of viewers to be developed
- System is flexible within boundaries
- Processes are encapsulated, reducing “the many ways to do the same job”
  - Reduces the risk of error
  - Decreases training time
  - Removes duplicate development processes
- Major ‘power’ is provided by the System Dictionary
  - Not a Thor deliverable
  - Needs to be worked, reduces other viewer requirements

## Simplification candidates

- Command Processor
  - Should not provide GUI’s for each user interaction
    - Other viewers provide controllability, where applicable (assumes User Class match)
    - Separate “controller” and “viewer” fail to encapsulate the functionality
  - May only require a Command Line Entry method
- Command Assignment GUI
  - Need not be developed
    - Functionality incorporated into System Dictionary

# Reference Information

| | |
|---|---|
| HCI Manager Program | An RTC applications product that provides access to all Dynamic Displays (User Class Preferences at the top). Also provides the capability to include system viewers if User requires this access on the Primary Monitor. |
| Viewability Controls | A capability that allows the user to selectively look at certain data or data elements. Where applicable, the ability to gather input from a list/file is provided. Specific viewability options vary from viewer to viewer. The User Class preference file is available to decrease sort time. |
| Subscription | A method that allows a user to select the type, category, instance, or general User Class message to be displayed by a message viewer. Defaults are provided by User Class. |
| Standard Controls | Normal windowing type controls: Cancel, Screen Print, Execute, etc. Many of these are also provided as part of the window header. This also includes “toolbars”. |
| PCL | A viewer that displays the relationship of PCL to FDs. When the system dictionary is developed this unique viewer is not required, the dictionary provides the capability. Control, if any, is provided through FD Details. |
| Command Assignment | A viewer that displays the relationship of FDs, Applications (displays and EIM/EICs) to User Classes. When the system dictionary is developed this unique viewer is not required. View/Control is provided through the System Dictionary (requires a CCW-Command Assignment User Class match). |